Comments from George - 11/22

QUALITY ASSURANCE PROJECT PLAN v1.0

Southeast Chicago Petroleum Coke Dust Investigation

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SECTION A – PROJECT MANAGEMENT

A.1 Title of Plan and Approval

Quality Assurance Project Plan
Southeast Chicago
Petroleum Coke Dust
Investigation

_____ Date: _____

Motria Caudill, US EPA Region 5, Project Manager / Principal Investigator

_____ Date: _____

Bonnie Bush, US EPA Region 5, Field Operations Manager

_____ Date: _____

George Schupp, US EPA Region 5, Laboratory ~~Analysis Manager~~ Deputy Director

_____ Date: _____

Bilal Qazzaz, US EPA Region 5, Quality Assurance Coordinator

_____ Date: _____

Loretta Lehrman, US EPA Region 5, Quality Assurance Manager

A.2 Table of Contents (not updated)

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A.3 Distribution List

Motria Caudill, USEPA Region 5

Bonnie Bush, USEPA Region 5

George Schupp, USEPA Region 5

Bilal Qazzaz, USEPA Region 5

Loretta Lehrman, USEPA Region 5

A.4 Project/Task Organization

Table A.1 Roles & Responsibilities (to be filled in by PI)

Individual(s) Assigned	Responsible for:	Authorized to:
Motria Caudill	• Principal Investigator • QAPP revisions, data analysis, report preparation	• Communicate findings to EPA and MDEQ
Bonnie Bush	• Field Operations • Train MDEQ field staff • QC on field sampling	• Collect data • Communicate with MDEQ
~~George Schupp~~ Colin/Rob/etc.	•	
Bilal Qazzaz	• QAPP review • Data validation	• Determine whether DQOs are met
Loretta Lehrman	• QAPP approval • Data package approval	

Figure A.1 Organization Chart

A.5 Problem Definition/Background

There are multiple facilities on Chicago's southeast side that have historically stored coal in large uncovered outdoor piles. The facilities, shown on Figure A.2, are currently owned by KCBX (North and South Plant) and Beemsterboer. In recent years these companies have also been accepting petroleum coke "petcoke" waste. Residents have reported clouds of dust blowing off of the storage piles into the nearby neighborhoods and black dust coating their property. Continuous ambient PM_{10} data collected by IEPA at Washington High School, about 0.8 miles southeast of KCBX South, suggests that elevated concentrations in early 2013 may possibly be attributed to petcoke operations. Fenceline air monitoring, as well as petcoke and dust wipe sampling, are needed to better understand community impacts from petcoke storage.

Figure A.2. Study Map

Using 114 authority USEPA Region 5 has required the two companies to install continuous and filter-based fenceline PM_{10} monitoring. Fenceline monitoring will show whether the National Ambient Air Quality Standard is being violated in the community and whether peak concentrations may be attributed to one or more of the petcoke facilities. KCBX and Beemsterboer are fully responsible to implement the ambient monitoring stations and provide EPA with their QAPP and all generated PM_{10} data. EPA is not

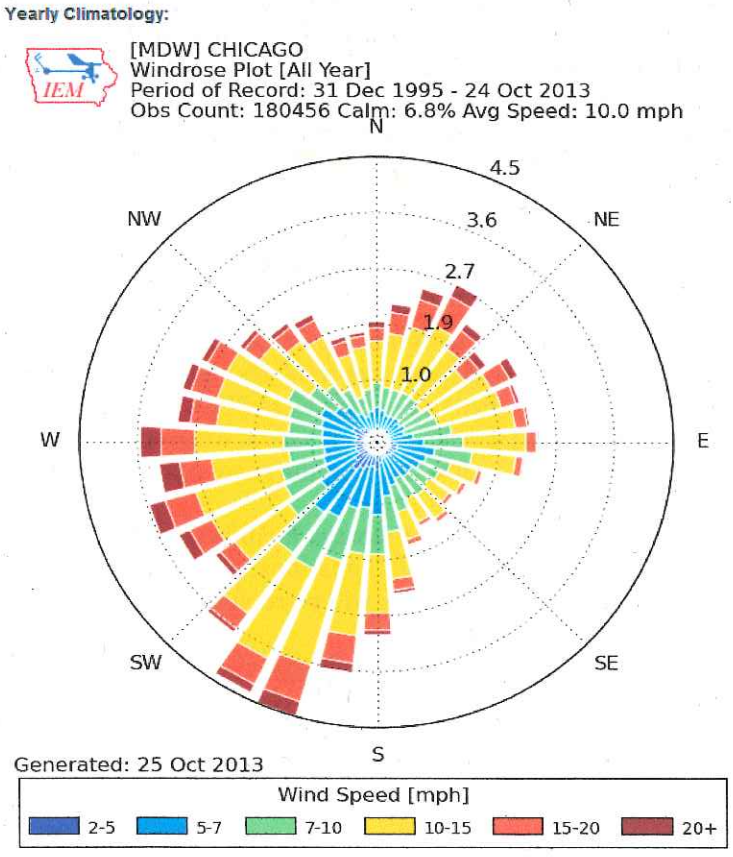
requiring the companies to perform speciation analysis on the ambient filters. However the filters must be archived by the facilities and EPA may conduct analyses for select dates to determine ambient metals concentrations.

The companies are also required to collect bulk petcoke samples for laboratory analysis. Samples will be split for duplicate analysis by EPA and the respective facilities. Additionally, EPA-ARD will conduct dust wipe sampling on adjacent residential, commercial, and/or municipal properties. EPA is in communication with citizen's groups who have been engaged on local air quality issues and who will inform EPA when dust clouds occur and where dust sampling should be performed.

The chemical profile (relative ratios of metals and PAHs) on industrial bulk material may potentially be matched to the material in dust wipes. This will allow EPA to confirm the source(s) of local dust. Ambient air filters speciated for metals may also provide useful information.

Below on Figure A.3 is a multi-year (1995-2013) wind rose produced using hourly meteorological data from Midway Airport. Prevailing winds are from the southwest, west, and northeast. Ambient air monitoring stations will be placed by the companies in the main upwind/downwind directions relative to the petcoke sources, i.e. near the northeast, east, and southwest property perimeter of the three respective storage sites. All stations will contain a continuous PM_{10} real-time instrument and one station per facility (KCBX North, KCBX South, and Beemsterboer) will also be equipped with a filter-based Federal Reference Method sampler. The companies are responsible for gravimetric analysis of the filters and will report PM_{10} ambient concentrations to EPA. EPA-CRL will conduct metals analysis of select filters. EPA-ARD will also conduct wipe sampling in the communities downwind of the petcoke storage sites.

Figure A.3 Midway Airport Yearly Wind Roses



A.6 Project/Task Description

KCBX and Beemsterboer will conduct at least one year of fenceline ambient PM_{10} and meteorological monitoring beginning in January 2014. Details on the monitor locations and sampling protocols will be available in their respective QAPPs, to be provided before monitoring begins. Documents provided by KCBX and Beemsterboer will be referenced in future versions of this QAPP. The companies are required to archive PM_{10} filters after gravimetric analysis. Select archived filters, e.g. those will especially heavy loading, will be analyzed for metals by EPA-CRL. PM_{10} filter samplers will operate on a 1-in-3-day standard EPA schedule, which will result in a total of about 360 total samples collected between the three facilities. Assuming that EPA will analyze 1-2 filters per facility each month, the laboratory should expect to run 30-60 metals analyses on PM_{10} filters. Samples will be analyzed via EPA Method IO-3.5 Determination of Metals in Ambient Particulate Matter Using Inductively Coupled Plasma/Mass Spectrometry (ICP/MS).

KCBX and Beemsterboer will collect bulk material samples from their respective petcoke piles for split analysis by their own contract laboratories and EPA-CRL. The exact number and location of samples will be proposed by the facilities prior to December 15th. The 114 information request to the facilities indicated that they should select locations "representative of all petroleum coke stored at [the facility] and submit an explanation of the sampling site selections to EPA". Upon EPA's receipt of the proposed number of sampling locations, ARD and CRL will decide whether some samples should be composited to save time and laboratory resources. All sample containers, chain-of-custody forms, and detailed sampling instructions will be provided to KCBX and Beemsterboer. CRL and the companies' contract laboratories will analyze the petcoke samples for the same list of metals and PAHs.

ARD will collect dust wipe samples of material that is believed to be deposited from the petcoke storage facilities. Beginning in early December, ARD staff will be in contact with community groups who will refer specific residents with dust complaints as they arise. For comparison, wipe samples will also be collected in urban Chicago neighborhoods that are not adjacent to petcoke storage. Bulk petcoke samples and dust wipes will be analyzed for metals via EPA Method 6020A Inductively Coupled Plasma-Mass Spectrometry and for PAHs via EPA Method method name.

A.7 Quality Objectives & Criteria

The main objective of multimedia sampling in Southeast Chicago is to determine whether particulate matter from petcoke storage facilities is affecting local residents' health and quality of life. Fenceline ambient air PM_{10} monitoring results (detailed in a separate QAPP) will be interpreted relative to the National Ambient Air Quality Standards. Onsite meteorological data will demonstrate whether elevated PM_{10} concentrations occur during periods when the monitor(s) are downwind of petcoke storage piles.

Ten or more ambient filters from each of the three storage facilities will be analyzed for metals to characterize each location's respective fugitive dust emissions. An adequate dataset is defined as seven samples per site (70%) or a total of 21. Blank filters will be requested from KCBX and Beemsterboer to characterize background contaminations of metals.

RLs?

The list of required metals and their respective detection limits are:

Element	MDL (to be provided by CLR)
Aluminum	
Antimony	
Arsenic	
Barium	
Beryllium	
Cadmium	
Chromium	
Cobalt	
Copper	
Lead	
Manganese	
Nickel	
Selenium	
Silver	
Thallium	
Vanadium	
Zinc	

CRL → Greg!

The appropriate number of bulk petcoke samples will be decided in future discussions between EPA and the storage companies. The target number of dust wipe samples is ten for both the adjacent community and non-local Chicago neighborhoods. Seventy percent (70%) completeness is adequate for this investigation.

Element	MDL in bulk sample	MDL in dust wipe (to be provided by CRL)
Aluminum (Al)		
Antimony (Sb)		
Arsenic (As)		
Barium (Ba)		
Beryllium (Be)		
Cadmium (Cd)		
Calcium (Ca) *		
Chromium (Cr)		
Cobalt (Co)		
Copper (Cu)		
Iron (Fe) *		
Lead (Pb)		
Magnesium (Mg) *		
Manganese (Mn)		
Mercury (Hg) *		
Nickel (Ni)		
Potassium (K) *		
Selenium (Se)		
Silver (Ag)		
Sodium (Na) *		
Thallium (Tl)		
Vanadium (V)		
Zinc (Zn)		

RL RL

Grey + Frances

Frances

*Element not determined for ambient air samples

PAH MDLs? → RLs

List of PAH parameters and MDLs to be provided by CRL

A.8 Special Training/Certification

Bulk samples will be collected by KCBX and Beemsterboer staff or contractors following the SOP provided in Appendix A (to be included by PI). Experienced EPA field staff will collect dust wipe samples following a the SOP in Appendix B (to be included by PI (to be included by PI). No additional training is needed.

A.9 Documents and Records (to be updated by PI)

The principal investigator (PI) will have responsibility to ensure all QAPP revisions are shared with project participants. Each revision of the QAPP will be numbered and dated.

A site notebook will be kept at the monitoring station. This will be a 3-ring binder that will contain the appropriate data forms for routine operations as well as inspection and maintenance forms and SOPs. Additional notes, such as weather conditions, will be noted whenever the site technician arrives.

Electronic data collection – In order to reduce the potential for data entry errors, automated systems will be utilized where appropriate and will record the same information that is found on data entry forms. In order to provide a back-up, a hardcopy of automated data collection information will be stored for the appropriate time frame in project files.

The PI will create a database for the sample results which will be used during data analysis. This database will be archived and retained for 5 years.

The PI will write the final report, which will summarize the details of the samples collected, the results of the analysis of those samples, outline the analysis performed, and the final conclusions/recommendations.

SECTION B – DATA GENERATION & AQCUISITION

B.1 Sampling Process Design (Experimental Design)

One year of ambient air monitoring and multi-media sampling in Southeast Chicago, January 2014 through January 2015, will determine whether particulate matter from petcoke storage facilities is affecting local residents' health and quality of life. PM_{10} air monitoring will show whether National Ambient Air Quality Standard exceedances are occurring. Laboratory analysis of filters, bulk materials, and dust wipes will demonstrate whether dust can be attributed to local petcoke storage facilities.

B.2 Sampling Methods

Fenceline PM_{10} air monitoring will be conducted by KCBX and Beemsterboer following standard protocols as detailed in the CFR. Site-specific procedures will be documented in QAPPs provided EPA-ARD.

Bulk material sampling will follow the ~~SOP in Appendix A. Dust wipe~~ sampling will be conducted following the SOP in Appendix ~~B~~. All sample media will be provided by CRL.

for EPA Samplers NOT BP, etc. Let's discuss.

B.3 Sampling Handling & Custody

PM_{10} ambient filters will be collected and stored by KCBX and Beemsterboer following appropriate CFR procedures. In reviewing the QAPP, EPA will request that chain-of-custody documents are produced and provided to EPA for filters that are to be analyzed. There are no temperature or holding time requirements for the 24-hour integrated PM_{10} filter samples.

KCBX and Beemsterboer will be responsible for collecting bulk petcoke samples in EPA-provided containers. The companies must follow the provided SOP, including all sampling and chain-of-custody procedures and transporting samples to EPA and their contract laboratories within the established holding times.

Need to specify these!

EPA staff will collect dust wipe samples with media provided by CRL and following the provided SOP. Personnel will follow chain-of-custody procedures, maintain appropriate sample temperature, and deliver samples to CRL within holding times.

quickly so analyses can be completed...

Sample delivery must be immediately following collection to give lab enough time to process and prep before H.T.'s expire

B.4 Analytical Methods

Table A-2 List of Methods and Target Analytes

Target Analytes	Method
Metals in ambient air	EPA Method IO-3.5 Determination of Metals in Ambient Particulate Matter Using Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)
Metals in bulk samples	EPA Method 6020A Inductively Coupled Plasma-Mass Spectrometry
Metals in dust wipes	EPA Method 6020A Inductively Coupled Plasma-Mass Spectrometry
PAHs in bulk samples	Name method EPA Method 8260
PAHs in dust wipes	Name method

B.5 Quality Control

1 per batch of 20 or fewer.

CRL – what are your recommendations on 1) how many blank ambient filter samples? 2) how many blank filter wipes?, 3) how many bulk material field blanks? What other type/number of blanks and duplicates should be included?

- Same

Soil/petcoke material will have sufficient sample size for any duplicates or matrix spikes.

wipes will not have field/matrix spikes or duplicates we will have to have with lab chips + spike only.

B.6 Instrument/Equipment Testing, Inspection, and Maintenance

CRL – do you have stock language on laboratory equipment testing/inspection/maintenance?

- per CRL SOPs + QA program

B.7 Instrument/Equipment Calibration and Frequency

CRL?? per CRL SOPs + QA program.

B.8 Inspection/Acceptance of Supplies & Consumables

Upon receipt of the Xact sample tape, field staff will visually inspect the media to look for any damage that may have occurred during shipping.

Everything that follows will be updated by the PI. >>>

B.9 Data Management

Data generated in the field by the Xact™ will be collected by the field technician via remote

computer access. Data will be checked by Field Ops Manager to ensure they meet with the QA/QC standards set forth in this QAPP. Quality-assured data will be put into a MS Excel database by the technician at their office location. EPA-CRL will make results of laboratory analyses available to the PI in the form of an MS Excel file.

The QA Manager will then quality assure the data, ensuring that the data is valid, and then pass the data on to the principle investigator. The PI will then consolidate the results into a database for analysis. This data, and the analysis, will be included in the final report.

SECTION C – ASSESSMENT AND OVERSIGHT (to be updated by PI)

C.1 Assessments and Response Actions

An assessment is defined as an evaluation process used to measure the performance or effectiveness of the quality system or the establishment of the monitoring network and sites and various measurement phases of the data operation. The results of quality assurance assessments indicate whether the control efforts are adequate or need to be improved. Documentation of all quality assurance and quality control efforts implemented during the data collection, analysis, and reporting phases is important to data users, who can then consider the impact of these control efforts on the data quality. In order to ensure the adequate performance of the quality system, the following assessments will be performed:

- Network siting and review. The EPA QA Manager reviewed siting criteria for the metals trailer prior to the beginning of the program.

C.2 Reports to Management

The principal investigator (PI) will summarize data results monthly and will write the final report. The monthly summaries will address performance evaluation and audits, as well as data quality assessments. The final report will consolidate QA findings and address the primary study questions. The PI will provide monthly and final reports to management within U.S. EPA Region 5.

SECTION D – DATA VALIDATION AND USABILITY (to be updated by PI)

D.1 Data Review, Verification, and Validation

Prior to performing any statistical calculations, the reported data from chain of custody forms are checked to ensure accurate transcription. This requirement does not apply to the Xact datasets, as they are remotely downloaded and physical samples are not handled.

D.2 Verification and Validation Methods

At least 10% of the database is checked to verify its validity. Items checked include original data sheets, checks of all calculations (from calibration to sample analysis), and data transfers. As the data are checked, corrections are made to the database as errors or omissions are encountered. If errors are located, all of the data is checked to verify data quality. Documentation of equipment and instrument calibration and other procedures are detailed in the laboratory's SOPs.

D.3 Reconciliation with User Requirements

Per the DQOs in Section A.7, data will be rejected if MDLs for toxic metals are not met. The PI will conduct a preliminary data review to uncover potential limitations to using the data, to reveal outliers, and generally to explore the basic structure of the data. The first step is to calculate basic summary statistics, generate graphical presentations of the data, and review these summary statistics and graphs. The PI will calculate statistics for toxic metal completeness and precision. Data will be qualified and used if criteria for completeness and precision are not met.

Appendix A

Standard Operating Procedure for Collecting Bulk Material Samples for Metals and PAH Analysis

Appendix B

Standard Operating Procedure for Collecting Dust Wipe Samples for Metals and PAH Analysis